

GURVANSH SINGH KALRA

Computer Science Undergraduate | Software Developer

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About Me

Computer Science undergraduate at SRMIST with strong foundations in programming, object-oriented design, data structures, and algorithms. Built projects spanning autonomous systems, AI-powered applications, and real-time interactive game development using C++, C# and Python. Experienced in modular architecture, containerized deployments, and event-driven systems. Passionate about building user-centric, scalable applications.

Skills

Programming Languages: C, C++, C# (Unity), Python, Java, JavaScript, SQL

Platforms & Engines: Unity, Godot

Core CS: Data Structures & Algorithms, OOP, DBMS, Operating Systems, Basic System Design

Web & Backend: React, Next.js, FastAPI, JDBC, API Development

AI/ML: TensorFlow.js, spaCy, NLP Pipelines, NetworkX, Gemini API, OpenAI API, Claude API

Cloud & DevOps: AWS Cloud Foundations, AWS Data Engineering, Docker, Git, Linux

Tools: VS Code, MySQL/SQLite, Apache Maven, Pytest, Bash

Projects

Prescient | *Python, Linux, Bash, BTRFS, Pytest, Threading, TUI*

- Developed a proactive, root-level Linux system guardian that hooks directly into native package managers (apt, pacman) to deterministically predict, prevent, and recover from system-breaking OS updates.
- **Engineered a low-latency (<200ms) Vanguard transaction auditor** that intercepts OS upgrades to evaluate kernel/DKMS module collisions, Secure Boot states, and /boot partition saturation before execution.
- Implemented a context-aware recovery orchestrator leveraging BTRFS (snapper) and timeshift, enforced by strict disk-space guardrails, cooldown heuristics, and atomic local rollbacks to prevent system bricking.
- **Architected a 100% “Zero-I/O” automated test suite** using pytest and pytest-mock, deploying conditional lambda side-effects to strictly isolate system calls (subprocess, shutil, os) and prevent host OS mutation during CI/CD.

LabTA - Autonomous AI Teaching Assistant | *Python, FastAPI, React, Docker, RAG, SQLite, Git*

- Developed an autonomous, code-aware AI Teaching Assistant that executes, diagnoses, and mentors students in programming labs through a closed-loop execution and feedback system.
- Engineered a modular architecture separating a browser-based IDE, asynchronous API orchestration layer, containerized execution sandbox, and AI reasoning agent to ensure scalability and clean separation of concerns.
- Integrated a Retrieval-Augmented Generation (RAG) pipeline that grounds debugging hints in course manuals and curated lab documentation instead of generating generic LLM responses.
- Built a git-diff-based patch suggestion system producing surgical code corrections, guiding students toward recovery without revealing full solutions; developed an “Apply Fix” engine that merges backend patches into the student’s code buffer.

Slither Fade | *Unity, C#, Git, GitHub*

- **Developed a Snake-inspired game in Unity (C#)** featuring an innovative time-based survival mechanic where the snake shrinks every 7 seconds, creating a uniquely pressured gameplay loop.
- Designed and integrated dual food systems, one regular food for growth and other “safe food” that extends survival time. This adds strategic depth and player decision-making to each session.
- Engineered core game systems including timed shrink events, collision detection and handling, and dynamic game state management from scratch.
- Balanced and refined mechanics through iterative playtesting, ensuring engaging difficulty progression and high replayability; managed full development lifecycle using Git and GitHub.

Experience & Activities

Second Prize Winner - Pentathlon 3.0, Hackstreet 4.0

March 2026

Next Gen AI, SRMIST

University-Level Hackathon

- Secured 2nd place among competitive multidisciplinary teams; developed **InsightNet**, an AI-powered knowledge discovery engine leveraging NLP, graph analytics, and interactive visualization for document intelligence.
- Demonstrated innovation in applied AI, research-oriented problem solving, and collaborative system development under competition conditions.

Operations Team Member

2025 – Present

TEDxSRMIST, SRMIST

- Supporting event operations, logistics, and on-ground coordination; collaborating with cross-functional teams to ensure smooth workflows and a seamless experience for speakers and attendees.

Game Development Associate

2024 – Present

Next Tech Lab, SRMIST

- Contributing to game development projects within the student-led innovation lab, focusing on design, implementation, and testing of interactive systems; collaborating with peers to explore experimental mechanics and emerging technologies.

Education

B.Tech in Computer Science and Technology (Core)

Aug 2024 – Present

SRM Institute of Science and Technology

Current CGPA (upto 4th Sem): 9.86

12th Grade - CBSE PCM + Computer Science

April 2022 – May 2023

Basava International School, Dwarka, New Delhi

86.83% | Cultural Secretary

Certifications

- **AWS Cloud Foundations & AWS Data Engineering - Amazon Web Services (Credly Verified):** Cloud architecture fundamentals, data pipelines, and deployment workflows.
- **Unity Essentials Pathway - Unity (Credly Verified):** Foundational certification in Unity engine, game object management, and interactive systems development.
- **NPTEL - Fundamentals of OOP, Programming in Java, DBMS (Verified):** Core CS coursework covering object-oriented design, Java development, and database management.